RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE

IN THE U.S. PATENT AND TRADEMARK OFFICE

June 18, 2009

Applicants: Edward John ANTHONY et al

For: IN-SITU CAPTURE OF CARBON DIOXIDE AND SULPHUR DIOXIDE IN A FLUIDIZED BED COMBUSTOR

Serial No.: 10/554 675 Group: 3749

Confirmation No.: 9665

Filed: October 10, 2006 Examiner: Mashruwala

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Atty. Docket No.: 5519.P0001US

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

I am the attorney of record.

(Please see the following pages.)

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on June 18, 2009.

Terryence F. Chapman

ARGUMENTS ACCOMPANYING PRE-APPEAL BRIEF REQUEST FOR REVIEW

Claims 1, 5, 6, 9-12 and 17 have been rejected under 35 USC 103(a) as being unpatentable over U.S. Patent No. 5 662 051 to Morin in view of EP 0 118 770 A1 to Tencati et al, WO 94/21965 to Nislick et al and U.S. Patent No. 4 738 207 to Moss.

The presently claimed invention is directed to an apparatus and process for capturing and recovering carbon dioxide and sulfur dioxide from the combustion of a carbonaceous fuel having a high carbon content, a relatively high sulfur content and a low ash content. The present invention requires the splitting of a flow of a particulate carbonaceous fuel into a major proportion and a minor proportion, transferring the major proportion to a pressurized fluid bed combustor and carbonator (PFBC/C), combusting the major proportion of the fuel flow in the PFBC/C in the presence of air and calcium oxide, recovering a flue gas flow containing calcium carbonate and calcium sulfate solids from the PFBC/C, separating the solids from the flue gas flow, transferring the minor proportion of the fuel to a calciner, combusting the minor proportion of the flow of fuel in the calciner in the presence of relatively pure oxygen and the solids separated from the flue gas flow to convert the calcium carbonate in the solids into calcium oxide and carbon dioxide gas, discharging and recovering a flow consisting essentially of carbon dioxide gas from the calciner, recovering a flow of solids from the calciner which includes the calcium oxide generated therein, transferring the flow of solids from the calciner to the PFBC/C to provide calcium oxide to the PFBC/C and recovering calcium sulfate and spent solids from the solids formed through the PFBC/C and adding fresh calcium carbonate to the calciner to maintain the solids balance within the process.

A major distinction between the currently claimed invention and the process of the primary Morin reference is that the present invention requires a minor portion of the

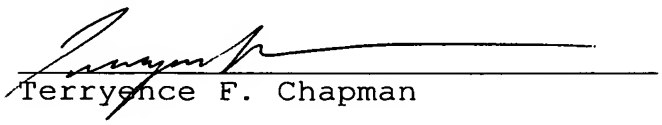
fuel and recovered flue gas solids including calcium carbonate and calcium sulfate to be combusted in a calciner in the presence of relatively pure oxygen in a manner to convert the calcium carbonate in the solids flow into calcium oxide and carbon dioxide gas and the discharge and recovery of a flow consisting essentially of carbon dioxide gas from the calciner. In contrast thereto, Morin discloses that a combustion residue 12 made up of lime, calcium sulfate and a small portion of coal ash is fed with a fuel 15 and air 16, which can be optionally enriched with oxygen, to discharge a gas 18, mixed with flue gases, including nitrogen, carbon dioxide, surplus oxygen and sulfur dioxide and sent to a sulfuric acid production unit 20. As discussed in lines 14-24 on page 9 of the present specification, the calciner is operated at a temperature which is not high enough to degrade the calcium sulfate to calcium oxide plus sulfur dioxide or to reduce the activity of the calcium oxide. In contrast thereto, as discussed at column 4, lines 25-28 of Morin, the temperature inside the unit 14 of Morin is specifically operated at a temperature of from 1100-1400°C so that the calcium sulfate is decomposed to give calcium oxide and sulfur dioxide. As such, the calciner 21 of the present application is specifically operated in a manner not to produce sulfur dioxide while the heat treatment unit 14 of Morin is specifically operated in a manner to produce sulfur dioxide and cannot discharge a flow consisting essentially of carbon dioxide gas.

The Examiner has stated that the feeding of calcium carbonate with the teaching of Moss would allow the calcinator 14 of Morin to emit more carbon dioxide gas. The Examiner specifically relies on the teaching of Moss to provide fresh limestone to the first conversion bed 12 to maintain the chemical composition and activity of the circulating particles. However, the addition of fresh limestone to the heat treatment unit 14 of Morin would still not suppress the formation of sulfur dioxide because Morin is specifically

concerned with operating the heat treatment unit in a manner that produces sulfur dioxide. Moreover, the Moss reference relies on a calcium sulfate/calcium sulfide chemical system as an oxygen carrier which is completely different from the calcium carbonate/calcium oxide system of the present invention as a carbon dioxide carrier.

Nislick discloses a flue gas composed of carbon dioxide, carbon monoxide, hydrogen and nitrogen and in Figure 1, "combustion air" is fed to the flue gas exiting the regenerator 12. This clearly indicates that this process does not produce a gas stream consisting essentially of carbon dioxide suitable for sequestration. Although Tencati does disclose a split feeder, it does not cure the deficiencies in the previously discussed references with respect to the presently claimed invention. Likewise, the Crawford reference also does not cure the deficiencies of the previously discussed references. Therefore, it is respectfully submitted that the Examiner's rejection of the claims is based purely on hindsight provided by Applicants' disclosure and the references cited by the Examiner do not even present a showing of prima facie obviousness under 35 USC 103(a) with respect to the presently claimed invention. Favorable consideration is respectfully solicited.

Respectfully submitted,



Terryence F. Chapman

TFC/smd

FLYNN, THIEL, BOUTELL & TANIS, P.C.
2026 Rambling Road
Kalamazoo, MI 49008-1631
Phone: (269) 381-1156
Fax: (269) 381-5465

David G. Boutell Reg. No. 25 072
Terryence F. Chapman Reg. No. 32 549
Mark L. Maki Reg. No. 36 589
Liane L. Churney Reg. No. 40 694
Brian R. Tumm Reg. No. 36 328
Heon Jekal Reg. No. 64 219
Eugene J. Rath, III Reg. No. 42 094
Dale H. Thiel Reg. No. 24 323
Sidney B. Williams, Jr. Reg. No. 24 949

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